

PHYSICAL MODALITIES FOR ACNE, ROSACEA, AND THEIR SEQUELAE

Section Editor: Emmy M. Graber, MD

Hair Dryer Use to Optimize Pulsed Dye Laser Treatment in Rosacea Patients

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Message from the Section Editor

It is with great excitement that I introduce this new section, "Physical Modalities for Acne, Rosacea, and their Sequelae" of The Journal of Clinical and Aesthetic Dermatology (JCAD). This section will present pearls for treating acne and rosacea using lasers and other minimally invasive modalities. I hope that this section will provide useful knowledge to supplement your medical armamentarium for treating acne and rosacea.

If you would like to contribute to this section, please contact me at egraber@bu.edu.

—Emmy Graber, MD



Abstract

Rosacea is a common chronic inflammatory condition characterized by erythema, telangiectasias, papules, and pustules. While there are many effective treatment options for the papulopustular type, laser therapy remains the most effective modality to treat erythematotelangiectatic rosacea. Erythema and flushing associated with rosacea remains an uncomfortable and socially embarrassing problem for patients. Unfortunately, patients often do not have significant erythema or flushing when they present for laser treatment. With this in mind, we propose a novel technique aimed at enhancing the response of rosacea patients being treated for erythema with pulsed dye laser. Specifically, we present a split-face example of our clinical observation that pre-treatment with forced heated air prior to pulsed-dye laser leads to a greater response in rosacea patients with erythema and flushing.

Introduction

Rosacea is a common, chronic inflammatory disorder characterized by erythema, telangiectasias, flushing, and in some cases, inflammatory papules and pustules. There is a clear and well-known tendency toward vascular hyper-reactivity. Rosacea patients have been shown to have a greater and more rapid response to foods known to induce facial vasodilation. In addition to foods, temperature is a known trigger for flushing in rosacea as well.¹ The telangiectasias and erythema of rosacea are a frequent complaint of patients. Although numerous topical therapies are approved and recommended in the management of acne rosacea, few adequately address the complaint of erythema as directly or effectively as laser procedures.

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Figure 1. The patient just prior to pulsed dye laser treatment. The patient has minimal erythema, but reported that the erythema would markedly flare with heat or alcohol consumption.



Figure 2. The patient immediately prior to treatment with the pulsed dye laser. The forced heated air is being utilized to induce flushing.

Pulsed dye lasers (PDL) of either 585 or 595nm wavelength have been reported to be effective rosacea therapy since the early 1990s.² Numerous studies have since confirmed the usefulness of PDL in reducing erythema, telangiectasias, and the incidence of flushing in rosacea.³ Additional studies have validated the use of the pulsed potassium-titanyl-phosphate (KTP)

laser as a treatment of choice for linear, arborizing, and discrete telangiectasias in rosacea.⁴ Alternatively, intense pulsed light has been demonstrated to reduce erythema and improve rosacea-associated telangiectasias.⁵

Lasers operate based on the theory of selective photothermolysis, whereby the wavelength of light emitted from a laser coincides with

the peak absorption spectrum of various chromophores, such as hemoglobin and melanin. The chromophores serve as targets for the laser and preferentially absorb the specific wavelengths of light emitted by the laser. By increasing the amount of target chromophores present in a treatment area, one would expect an enhanced response to laser treatment, with a greater number of blood vessels destroyed. It is based on this presumption that the authors present a novel technique that is helpful in maximizing the results in rosacea patients undergoing laser treatment for flushing and erythema.

Technique

Prior to treatment with the PDL (Figure 1), the authors expose the treatment area to forced heated air by directing a standard hair dryer at low intensity toward the treatment areas. The duration of heat application varies depending on the time necessary to induce maximum erythema of the treatment area. The hair dryer is held at a distance from the skin based on the patient's comfort level, but generally a distance of approximately 6 to 10 inches from the skin is sufficient and well tolerated, as shown in Figure 2. The distance from the face should be adequate to prevent any burns. It may be preferable for patients to hold the hair dryer themselves so that they can self-adjust the distance of the hair dryer to prevent overheating. Immediately following achievement of maximum erythema, as demonstrated in Figure 3, the patient is treated with laser while the maximum amount of target chromophore remains within target vessels.

Discussion

The authors present a novel pre-

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treatment technique that they have observed to enhance their rosacea patients' responses to vascular laser procedures for erythema and telangiectasias, as shown in Figure 4. Not only does this method of vasodilation potentially increase the targeted oxyhemoglobin in the skin, it theoretically may counter the vasoconstrictive effects of the epidermal cooling devices used in association with PDL. Although there has not been histological confirmation, the authors presume that heat-induced vasodilation leads to increased blood vessel destruction, which accounts for the enhanced clinical response seen in the patients they treat with this technique. In addition to being convenient and easy to perform, this method is safe and has minimal cost burden to the practitioner and the patient. It is important to note that there is a theoretical risk of epidermal burning from excessive heat exposure, thus the authors have the patients hold the heating device themselves so that they can control their comfort level and maintain a safe distance to prevent burning.

The authors have used a variety of methods in addition to forced heated air aimed at enhancing facial erythema prior to treatment with the PDL. Given the natural fluctuation of erythema, patients may not present with the same degree of redness at the time of treatment as they did in consultation. Several other methods to enhance facial flushing and redness include exercising, overdressing, and consuming trigger foods and beverages. Facial redness may also intensify by inverting the head (either by a handstand or simply bending forward) to increase blood flow to the face.

The use of topical vasodilators is another way to magnify facial



Figure 3. The patient during application of the forced heated air to her left cheek. As a result of the heat application, she has marked erythema.



Figure 4. The patient's baseline erythema was reduced at three months following the procedure. She also reported lessened erythema when consuming alcohol.

erythema. Cho et al⁶ treated patients with facial flushing by enhancing erythema with the application of nicotinic acid cream prior to treatment with the PDL. They found improved results after this pre-treatment. Kim et al⁷ used topical niacin to boost the response to PDL for erythema in a split-face study of rosacea patients. This study showed an improvement in the niacin-treated side both in terms of physician assessment of clinical improvement and patient satisfaction. However, this study was limited by a small sample size. Although not described in the literature, topical nitroglycerin, tetracaine, and lidocaine have also

been noted to induce erythema and may be other potential pre-treatment agents that can be used to optimize the response to vascular laser treatments.

The utility of topical and physical vasodilators as a pre-laser technique is not limited to cases of erythema or flushing secondary to rosacea only. The same techniques can be applied to patients undergoing any vascular laser treatment for erythema or flushing, such as those with photo-induced telangiectasias or port-wine stains. Although no studies have been conducted, it seems reasonable to expect that any amplification of the target chromophore in the skin

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should yield an enhanced response to laser treatment. This is an area where additional investigation is warranted.

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